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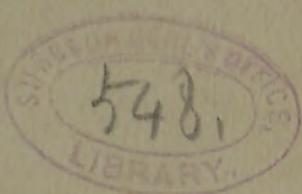
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CERTAIN POINTS IN THE MEDICO-LEGAL INVESTIGATION OF GUNSHOT WOUNDS.

EXAMINATION OF WEAPON, BODY, AND SURROUNDINGS.

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THE condition of a weapon with which any shooting which may become the subject of a judicial investigation has been done should be carefully studied, as it may throw much light upon the case. Its position should be noted, and care taken to learn if it has been moved since its discovery. In two trials for murder I have seen the question of whether the weapon had been moved or not most fiercely contested, the point being of extreme importance in each instance. In the case of a deputy sheriff killed in Denver by a policeman while himself resisting arrest, as it was maintained, the relationship of the weapon to the position of the body was of importance in determining whether the deceased was resisting arrest at the time of the shooting or not. The evidence upon this point was of such a conflicting nature that the result of the contest was of less value than it might have been otherwise. In a case in Pueblo

County, Colorado, 1895, concerning which Dr. Hubert Work consulted me, the discrepancy between the direction of the ball and the alleged position of the revolver at the time of the shooting was sufficient to overthrow the claim of accidental shooting, and the prisoner was convicted of manslaughter.

An accurate drawing of the surroundings is of great value, as in other cases of like nature. Walls, fences, and other surroundings should be carefully searched for bullet marks, unless every shot be positively accounted for. One of six shots in one of my cases must apparently have escaped from an open window or door, and the third shot in another case, neither of them being accountable for in any other way. The person of the one shot should be examined *in situ* if possible, to learn its relation to the bullet marks in the floor or walls, if such exist; to determine whether any staining by powder or burning by the gases of combustion exist, and to make certain in every way that a complete view of the case is obtained. The clothing requires particular care if one would avoid overlooking burning or staining, and especially if the fabric be of dark color. The adjacent region should be searched for pieces of wadding or the round wads used in shotguns, if the weapon used has been one requiring or making probable the use of a wad. The assailant has repeatedly been detected by the study of the material used for wadding, so that it should be carefully preserved. In these days of breech-loading guns and fixed ammunition the point is likely to be of less importance than when muzzle-loading arms were used and the wadding might be taken from paper or cloth in the possession of the one doing the shooting.

The amount of blood lost and its character, whether clotted or not, and the extent to which it has stained the

clothing, should be noted. The direction of its flow may give valuable information as to whether the one shot has stood erect after being injured or not. Other appearances which may be of value in particular cases may also be found. It should be noted that it is not at all necessary that blood should issue from a fatal wound in sufficient quantity to stain the clothing materially, as the hæmorrhage is often almost solely internal. I have known a man to run eighty feet after a bullet wound which caused death from hæmorrhage in a short time, falling then from shock and loss of blood, but careful search failed to reveal a drop of blood upon the floor in the course which he had taken. I have many times seen animals and birds dead of internal hæmorrhage, after gunshot wounds, without the escape of sufficient blood to show through the hair or feathers, as the case might be.

The weapon may be grasped by the hand of the deceased, or it may have been placed in the hand with the purpose of deception. One should note the tightness of the grasp, for if held firmly it is almost certain evidence of suicide if the wound has come from that weapon.

The character of the wounds should be noted—number, size, direction, tattooing,* branding; the relation of the tattooing or branding to the wound, whether above, below, or to one side; † the direction in which the grains of powder have been driven under the skin if they are present, a point of vital importance at times; the number of grains

* Of the modifications in the color of the tattooing from the use of nitro-powders I have treated in the *Trans. of the Colorado State Medical Society*, 1892.

† In *People vs. McLauthlin*, Logan County, Colorado, 1890, the question of murder or accident hinged solely upon the location of the brand (see *Boston Med. and Surg. Journal*, August 14, 1890), and in *People vs. Orns*, Denver, Col., 1892, the same matter was of almost equal importance.

of powder, if it be thought necessary to count them; whether the hairs of the part or the fibres of the clothing have been burned; and in face wounds, the eyes should be opened, to learn if the tattooing have involved the conjunctivæ or only the lids.

In investigating the course of the wounds in the body, the direction from which the ball has come may be shown, within certain limits, by the obliquity of the wound through the skin, as I have frequently observed, and as has been recently pointed out in the Farrar case by Dr. J. A. Mead, of Massachusetts.* One side of the orifice shows in such a case more marked staining and inversion than the others, showing that it has received a firmer impact from the missile causing the wound. This is upon the side of the acute angle. Indeed, if we make the angle sufficiently acute, we may merely cut a trench out of the integument, as I have seen many times in animals slain in the field and several times in the human subject. The position assumed by Dr. F. A. Harris, in the case just quoted, is certainly untenable. I have, in the presence of other physicians, at an autopsy, indicated the approximate course of the ball from a study of this feature alone before the wound was explored.

Projecting splinters of bone, or fibres of tendon or aponeurosis, dragged along in the course of the ball, or fibres of clothing carried in in the same way, furnish indisputable evidence of the direction in which the ball has passed through the body. The inversion of the wound of entrance, so commonly mentioned, and the eversion of the wound of exit are also valuable as evidence. In regions having much subcutaneous fat, however, the wound of entrance may be everted. I have, from such evidence offered in court, seen the dying declaration as to the direction from which he

* *Boston Med. and Surg. Journal*, April 25, 1895.

had been shot, of a man dying shortly after the attack, absolutely disproved, so that his attorneys abandoned the contention that he had been shot from behind. In a case where dispute is likely to arise over such a matter, it would be well to preserve, for instance, a portion of the bone through which the ball had passed, if possible to do so, as such an exhibit would furnish absolutely unanswerable evidence if shown to the jury.

Photographs of the wound I have found better than drawings, although in certain cases the latter have been invaluable.

It is well, before the trial, to test a weapon exactly similar to the one with which the shooting has been done, with similar ammunition, at different distances, in order to be better able to answer questions concerning the distances at which the brand or tattooing are to be found, at which hairs will be burned, or clothing fired, according as these things may be thought to have a bearing upon the particular case.

I have made it a custom to preserve the targets in such cases in order to show to the jury the exact results of the shooting—for example, at one foot, two feet, or any other distances of interest in the case, as well as the tattooing and brand. The latter are well shown upon white blotting paper, and I have found nothing better for the purpose.

The weapon, if loaded, should have the remaining loads as well as the empty shells, if it be a breech-loader, removed, that there may be no danger from it in the further examination. The cartridges and shells should be marked and securely kept by the proper authority. The size, make, calibre, number or mark, length of barrel, weight, and general condition of the weapon should be noted, and whether it be rifled or not, and hammerless or not. Any peculiarity of construction should be observed; thus, some of the

newer revolvers are so arranged that accidental shootings are impossible under certain conditions where they might easily occur with other forms of weapon, the reason being that only when the trigger is pulled in conjunction with pressure upon a certain part of the handle can the arm be fired. The condition of the barrel and, if the weapon is a revolver, of its separate chambers should be noted, for the fact that they are clean or not may be of the utmost importance in determining whether the weapon has been fired, or fired more than once.

In examining the cartridges not only the manufacturer's mark should be noted, but whether the hammer has marked the primer, for such an indentation may show that an attempt has been made to shoot, but has been foiled by the non-explosion of the primer. I have known a man to fail to shoot an adversary merely because of such a miss-fire.

If separate bullets have been used, their exact size and weight must be taken, for the mere statement, for example, that a ball is of 0·45 calibre may be very far from covering the whole ground. It is possible to use many different styles of bullet in one revolver, or even cartridges made for a smaller weapon, as I have seen done, and it may be essential to establish that those remaining in the weapon are of the same size as those found in the person of the deceased. Even all bullets nominally of the same size are not of the same calibre. The various 0·32 calibre cartridges on the market vary in the exact calibre of the ball from 0·308 to 0·323 inch, while the weight runs from 46 to 250 grains, and the powder charge varies from 6 to 40 grains. The 0·38 calibre cartridges vary between even wider limits. Hence the general observation that a cartridge is either "long" or "short" should not be considered sufficient.

Sonnenschein mentions a case in which the finding of an unusual amount of antimony in the bullet assisted in fixing the identity of the shooter, which illustration will serve to show the importance of a minute examination of everything bearing upon the case.

Shot should be weighed and counted and their exact size determined.

It may possibly be of importance, in case a repeating arm has been used, to determine whether the cartridges have been carried long in the magazine, and this may often be settled by noting whether they have been battered anteriorly by coming in contact with the breech of the shell in advance. Soft lead bullets show such markings very distinctly if carried a short time in the field.

The sights of the weapon should be examined with care, especially to learn if they have become displaced or loosened. As the sights are detachable, it is perfectly possible that an accidental shooting may have occurred from a change in the position of one of them, as in the foolish attempts to shoot a pipe from one's mouth or an apple from the head. I have known many wild shots made at a target and at game from this cause, although they are more common from changes in the elevation of the rear sight. A professional friend tried a new rifle at a mark, at one hundred yards' distance, in order to see if it shot correctly. His negro servant, against the advice of the shooter, persisted in standing about five yards from the mark upon the log cabin to the right. The first shot imbedded itself in the wood just in front of the negro's head, the sights being utterly out of line, and causing a deviation of five yards in one hundred yards' distance. If the rear sight is elevated and the gun sighted at a near object, it will overshoot, while if the rear sight is displaced to the right or the front one to the left, it shoots to the right, and *vice versa*. It

should be noted that a very slight movement of the sight is needed, in short weapons especially, to produce a considerable deviation in the course of the bullet. In connection with other points, these might be of much value in distinguishing a homicide from an accidental shooting.

The trigger pull, varying from almost nothing in guns with a set trigger to even twenty or thirty pounds in old muskets, should be noted, for it may make a great difference in the accuracy of aim possible with a given weapon. Many shooters pull a hard-shooting rifle to the right, even if using great care. In the case of the pistol, if the trigger pull is excessive, one may pull it entirely off the mark. Dr. J. T. Eskridge has recently communicated to me the details of a case in which a would-be suicide pulled the revolver so far to one side from the cause mentioned as to miss her head entirely in her attempt to shoot herself. She apparently lacked the determination to try it again.

In some revolvers the notch serving to hold the hammer at full cock is filed away, so that the weapon will not stay cocked, but is discharged either by raising the hammer and allowing it to fall suddenly with the thumb of the hand holding the stock or with the fingers of the opposite hand. The trigger is tied back in some cases to attain the same end. In my own practice I have seen the results of two accidental shootings from pulling the trigger in excitement in handling a double-action weapon, which does not require to be cocked, but is discharged by simply pulling the trigger. In one of the cases the revolver was discharged in the pocket of the owner while he was hunting for a man with whom he had quarreled, and the resulting wound prevented him from pursuing his antagonist further.

I once testified in court that a certain pistol with which

a woman had been killed would not remain cocked, after having tried it several times to make certain of its condition. After the case had been given to the jury, in explaining the matter to a friend, I tried it again, and it remained at full cock. Although I tried it many times afterward, it did not do so again. In this case enough of the notch remained to hold it this particular time, although it could not ordinarily do so. Fortunately, the error was of no serious importance in this case, but if the weapon had been handled when cocked the slightest jar might have caused its discharge.

The examination of the place of the shooting should be conducted with such care that every material fact shall be established. A battered bullet must have been checked by some hard substance, which should be determined if possible. The bullets should be examined with the microscope, if necessary, for traces of blood, fragments of bone, fibres of clothing, or anything else of interest in the case, and the identity of each missile found should be established. One of my cases was markedly influenced by establishing the identity of a certain ball found near the body, it being proved by its battered appearance and the fact that woolen fibres were adherent to it that it must have caused a particular wound, and that therefore it must have been fired from the front and not from the rear, as charged in the dying statement of the man killed.

The places of impact of the different bullets should be carefully described, as well upon the walls of the room or surroundings as upon the body.

It is needless to go into the details of the conduct of the autopsy further than they relate to the bullet wounds, but it is perhaps well to caution the examiner to make certain that no other cause of death could have been operative, and to settle definitely, if possible, which wounds have been

necessarily mortal and which bullets caused them. These points become of the utmost importance if more than one person is supposed to have participated in the shooting.

I know of no department of our professional work in which the minutest attention to details is of more importance than in these investigations, and none in which such attention is more certainly productive of good results when we are called to the witness stand.

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